

REMARKS

Applicants respectfully request reconsideration of the application, as amended, in view of the following remarks.

The present invention as set forth in **amended Claim 1** relates to a **conductive carbonaceous-fiber fabric** which has a thickness of from 0.05 to 1 mm, a weight per a unit area of from 60 to 250 g/m², a **bending resistance (L) as determined by the 45° Cantilever method of 6 cm or higher**, and an in-plane volume resistivity of 0.2 Ω cm or lower,

wherein the fabric comprises a binder or a product of carbonization of the binder in an amount of from 10 to 40% by weight and comprises carbonaceous fibers bonded to one another with the binder or its carbonization product through point contact,

wherein the binder or its carbonization product is present discontinuously as particles on the surface of the fibers, and

wherein said conductive carbonaceous-fiber fabric is obtained by weaving the yarns of carbonaceous fibers.

Applicants wish to thank Examiner Hai Vo for the helpful and courteous discussion with Applicants' Representative on November 23, 2005. During this discussion it was noted that Koschany et al disclose that starting materials used for the gas diffusions electrodes are very light, not necessarily electrically conductive, but mechanically stable support materials which comprise fibers in the form of non-wovens, papers or woven fabrics (Koschany et al, col. 2, lines 36-40). In other words, Koschany et al think that all forms of support materials, either non-wovens, papers or woven fabrics, work the same for gas diffusion electrodes and they don't even require the material to be electrically conductive. However, in the present invention, a **conductive carbonaceous-fiber woven fabric** is claimed.

Further, it is stated at col. 2, starting at line 47 of Koschany et al, that when using carbon materials as support materials, nonwovens made of carbonized or graphitized fibers

are particularly suitable due to their light weight high open porosity. In other words, if Koschany et al make a carbonaceous material then it's a nonwoven and not a woven as claimed. This is further evidenced for example by Example 1 at col. 8. Koschany et al do not recognize that woven conductive carbonaceous-fiber fabrics are superior to nonwovens.

As discussed in the specification of the present invention, it was an object of the present invention to provide a conductive carbonaceous-fiber fabric that has the advantages of woven fabrics (compared to carbon papers) such as freedom from mechanical brittle ness, high gas permeability and elasticity in the thickness direction. See paragraph bridging pages 4 and 5 and page 6, 1st full paragraph. In addition, it was an object to impart high stiffness and stable electrical conductivity on the fabric. This has been achieved with the fabric according to the present invention. The superior properties of the conductive carbonaceous-fiber fabric as claimed are not recognized by Koschany et al.

Miwa et al relates to a **carbon paper** which is obtained by molding chopped carbon fibers with a binder and carbonizing the molded products (col. 7, lines 20, 35, 48, 49). There is no motivation to combine Koschany et al with Miwa et al because this combination would materially change the **carbon paper** of Miwa et al. There is no motivation in Miwa et al to change from a carbon paper to a woven fabric as claimed.

Further, amended Claim 1 distinguishes the present invention from Tajiri et al because random webs are fabricated in this prior art reference by **hot pressing and melting** various fibers and phenolic resins to obtain pre-prepreg sheets which are then **molded** to provide a porous sheet. See Examples 1-15 at column 16 of Tajiri et al. Thus, there is no woven fabric in Tajiri et al.

The secondary references Schultz and Kato do not cure the defects of the primary references.

Finally, none of Miwa et al, Koschany et al, Schultz, Tajiri et al and Kato disclose or suggest a conductive carbonaceous-fiber fabric as claimed having a **bending resistance (L) as determined by the 45° Cantilever method of 6 cm or higher**. It is not obvious or inherent to make a woven fabric having the claimed bending resistance. As disclosed in the specification of the present invention in the paragraph bringing pages 9 and 10:

Ordinary carbonaceous-fiber woven fabrics are pliable, and the woven fabrics with thicknesses in the range of from 0.05 to 1 mm generally have a bending resistance (L) of 5 cm or lower. The invention has succeeded in increasing the bending resistance (L) by mutually fusing or bonding the fibers constituting a conductive carbonaceous-fiber sheet. The bending resistance (L) of the carbonaceous-fiber sheet of the invention is preferably 8 cm or higher.

Further, the specification discloses at the paragraph bridging pages 11 and 12:

In the case where a carbonaceous-fiber sheet having too high stiffness is used as a gas diffusion layer material for fuel cells, the sheet is difficult to wind into a roll and, hence, tends to have reduced handleability and reduced transportability. Productivity also is apt to decrease.

Thus, even a combination of Miwa et al, Koschany et al, Schultz, Tajiri et al and Kato cannot result in the present invention.

Therefore, the rejections over Miwa et al (US 4,851,304), Koschany et al (US 6,183,898), Schultz (US 3,960,601), Tajiri et al (US 5,648,027) and Kato (US 6,127,059) are believed to be unsustainable as the present invention is neither anticipated nor obvious and withdrawal of this rejection is respectfully requested.


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This application presents allowable subject matter, and the Examiner is kindly requested to pass it to issue. Should the Examiner have any questions regarding the claims or otherwise wish to discuss this case, he is kindly invited to contact Applicants' below-signed representative, who would be happy to provide any assistance deemed necessary in speeding this application to allowance.

Respectfully submitted,

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